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Philip J. Arnholt

*University of Nebraska*

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## USE OF MUSHROOMS IN THE BIOLOGY LABORATORY

Philip J. Arnholt, Botany Department, University of Nebraska.

Students in high school and college biology courses are easily motivated if they are presented with the proper materials. Obtaining and organizing these materials is the problem of the teacher. This can be quite a task for a teacher who has five or six sections of 20-30 students every day. Materials which can command the interest of the student and are easily prepared are, therefore, very desirable.

I have found both high school and college students in biology and botany to be intensely interested in mushrooms if the material is presented properly. Unfortunately, most high school and college laboratory manuals do an inadequate job of presenting this interesting group of plants. They are characterized by poor illustrations, inadequate representation of the various groups of fungi, little or no discussion of tropisms, lack of experimental studies of growth rate, and neglect of the role of fungi in ecosystems. In addition, many teachers have had little experience with the fungi. This results in a superficial treatment or complete omission of this group of plants.

Many attractive materials and activities are available for a teacher interested in developing a unit on the mushrooms. Some of the materials that I have used with success are as follows:

1. A set of lantern slides of the various types of fungi eg. gill, pore, puffballs, and morels can be purchased from most biological supply houses. Such slides would preferably illustrate common local types of mushrooms. Most students will be familiar with at least some of the mushrooms illustrated. This usually opens the way for discussion of such aspects as habitat, various types of mushrooms, role of mushrooms in the disintegration of wood and leaf litter, and poisonous mushrooms.

2. A super eight film loop of mushroom growth and development is available. The film loop introduces the questions of development, phototropism, and geotropism.

3. If possible, take a field trip for the purpose of collecting mushrooms. In Nebraska many mushrooms can usually be found in wooded areas on warm cloudy days 24-72 hours after a rain. This is especially true in the spring and fall of the year. Once the mushrooms are collected there are several things students can do. "Spore prints" are important for mushroom identification and can be made by placing the sporophore on a piece of paper for several hours to overnight. The mushroom will release its spores and produce a "print" on the paper. Both black and white paper should be used for making prints in case the mushroom produces white spores. Many mushrooms can be dried and stored indefinitely. This is especially true of forms like the shelf

fungi and puffballs.

4. A set of preserved mushrooms can be purchased from most biological supply houses. Such materials are generally unattractive and should be used only to supplement fresh material.

5. A species of *Coprinus* grows commonly on lawns in the spring of the year. Students should be encouraged to pick out a mushroom in the button stage and measure its growth over a period of time. A graph of the growth rate could be made and perhaps a comparison could be made between day and night growth rates.

6. Microscope slides of the gills of *Coprinus* can be purchased from biological supply houses. These along with fresh mushrooms purchased from the grocery store can be used for the study of morphology. The structure of the stalk, cap, gills, and annulus can be studied with the fresh specimens. The microscope slides show a transverse section through the basidocarp. The gills with their basidia, sterigmata, and basidiospores are illustrated. Questions with regard to spore production, spore dispersal, and life cycle can be introduced.

Some activities which are more involved include attempting to grow mushrooms from spores, or grow mushrooms by using a mushroom growth kit which is available from biological supply. Also, Morholt et. al. (1958) describes a respiration experiment with mushrooms.

Students should be introduced to some of the many textbooks and field guides which are found in nearly every library. Scagel et. al. (1966) describes the various groups of fungi from an evolutionary standpoint. Plant morphology and botany textbooks generally present a brief survey of the various groups of fungi. Field guides and books on mushroom identification are too numerous to mention. Smith's (1958) *Mushroom Hunter's Field Guide* has many excellent descriptions and photographs and seems to be quite popular.

In conclusion, I would like to reemphasize the fact that the innovative teacher can easily involve students in the study of higher fungi. Be sure to take advantage of this fact. A range of laboratory exercises from rather simple to quite complex can be designed by using the suggested materials.

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